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Original Research

Inconsistencies in the Dynamics of Sustainable Development Dimensions in Central and Eastern European Countries

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Abstract

Sustainable development aims at balancing the performances of economic, social, and environmental sectors, a key question in this regard remaining whether progress has been made. Accordingly, our attention was directed on the Central and Eastern European Countries (CEECs) and on their wellbeing particularities, with focus on the environmental dimension. The aim of this paper was to analyze the dynamics of environmental wellbeing in relation to human and economic wellbeing. Using national data of CEECs registered between 2006 and 2016, pooled, fixed, and random effects panel models were applied. The main results revealed that, in the considered countries, the economic and social dimensions report different evolutions compared to the environmental one. The economic components register a negative influence on environmental wellbeing while the human dimension and its social components are positive in relation to it, good governance excepted. Our paper also intended to analyze the relationship among the three wellbeing dimensions in both the efficiency- and innovation-driven economies of CEECs. In the latter ones, the economic component plays a greater role in determining the level of environmental wellbeing while, in the others, priority has to be given to human wellbeing components, especially the ones related to basic needs, personal development and health.

Keywords: sustainable development, environmental wellbeing, human wellbeing, economic wellbeing, CEECs, panel data modelling

Introduction

Sustainable development theory is formed around its major task of balancing the performances of economic, social and environmental sectors. The main aim of this integrative process is to offer consistent and healthy national progress. Besides the theory and the recommendations (abundant in the academic literature, but also in the political discourse) based on its main dimensions, the reality apparently reveals an irregular evolution of the economic, social and environment sectors' results. Observation of this evolution may represent a support for both mainstream sustainable

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theory, but also for its critics, in response to some questions regarding their positions, thus acting as a basis for the formulation of some hypotheses related to the two directions of thinking. Firstly, the potential failure of offering consistency in the dynamics of sustainability's three components could be a means for the antagonists of the sustainability concept, seen by them as a utopic (although desirable) one, sustaining and confirming their view. Secondly, it may be the argument for the ones believing in sustainable development to show that, although the endeavors made for improving the economic, social and environmental results were consistent (especially at declarative levels), at least one of the three, but the most commune – the environment, is sacrificed for obtaining higher levels of the other(s). According to this optimistic view of supporting the sustainable development theory, the fact-finding mission of analyzing the dynamics of its dimensions may confirm that the selected strategies and actions are not the correct ones or (at least) are not applied in a proper way in order to significantly contribute to improving its levels.

Considering these aspects and also observing that it is a commune practice that the relation of influence between environment and society, with its two components, i.e. economic and social, to start from environment, as a main determinant of society's wellbeing [1-10], we intend to put the environment in the center of our discussion. This option is clearly argued by our attempt to understand the manner in which sustainable development is put into practice within actual societies. Moreover, considering that the sustainability concept appeared with the main aim of integrating environment within the other two dimensions for its more efficient protection, changing the direction of analysis (i.e. from society to environment) offers the possibility of finding out more about the aspects that have to be taken into consideration for more oriented attitudes and actions regarding the environment. Thus, investigation of the main determinants of its wellbeing helps us identify the components of the other two dimensions of sustainability with negative influence upon it and, in this way, understand the most vulnerable zones affecting the environment, while offering high levels of human and economic wellbeing.

Allin and Hand [11] (p. 8) remember the three areas of capital that can be used and developed for the general wellbeing described by the Belgian Federal Planning Bureau: (1) human capital: comprising the standard of living (material wellbeing), health (both mental and physical) and knowledge/capacities (what individuals know and are able to do); (2) environmental capital: including both natural resources (water, air, land and mineral resources) and the biosphere with all its biological diversity; (3) economic capital: subdivided into physical and technological capital (equipment, buildings, infrastructure, and intangible assets, including software and technology patents) and net financial assets. Following these areas of capital and also the main indicators of the Sustainable Society Index (2006-2016), the aim of this paper is: (1) to empirically analyze the specific dynamics of the environmental component of wellbeing in relation to the human and economic ones, in the Central and Eastern European Countries (CEECs) in the 2006-2016 period; (2) to observe the nature of influence of the same human and economic components on environmental wellbeing in the efficiency- and innovation-driven economies from the same group of countries in order to perform a comparative analysis of them.

Thus, our attention is directed on the group of CEECs and on their wellbeing particularities, with focus on the environmental dimension. To this end, we considered: (1) the basic needs (food, drinking water, and safe sanitation); (2) personal development and health (education, healthy life, and gender equality); (3) a well-balanced society (analyzed by income distribution, population growth, and good governance); (4) transition (organic farming and genuine savings) and (5) economy (GDP, employment, and public debt).

In this way, our paper intends to empirically analyze the influence of the economic and social dimensions upon the environment, in order to find out if, in the CEECs, the principle of sustainable development is correctly put into practice. In detail, we intend to observe if high levels of the components of economic and social dimensions are offered in the context of high levels of environmental wellbeing. The analysis was developed between 2006 and 2016, to observe whether the evolution of the social and human dimensions, with the specified components, is accompanied by the evolution of environmental wellbeing or, on the contrary, it is made at the expense of the environment. In other words, we want to investigate if the development model applied in the CEECs along the analyzed period is the same classical economic growth-oriented one or if the countries have really started to adopt the sustainable development principles, succeeding in putting them into practice and offering sustainable economic, social and environmental progress. To respond to this, we start from the following hypotheses:

(H1): The economic, social and environmental dimensions of sustainability register a different evolution in the CEECs along the 2006-2016 period;

(H2): The economic, social and environmental dimensions of sustainability are closely linked to each other along the CEECs in the 2006-2016 period;

(H3): Both components of economic and social dimensions represent determinant factors for environmental wellbeing in the CEECs along the 2006-2016 period;

(H4): The economic and social determinants of environmental wellbeing are different in the efficiency-driven economies compared to the ones from the innovation-driven group of CEECs along with the 2006-2016 period.

We consider that the obtained results may offer a clearer image of the particularities of the influence

of social and economic pillars on environment in the CEECs and also of the differences of this influence in the two types of analyzed economies from this group. In this respect, for observing the relationships among the three dimensions of sustainable development, we focused on their wellbeing. Thus, the practical state-of-art of their possible reconciliation may be investigated by analyzing their evolution in terms of economic, social and environmental wellbeing indicators. This option gives us the possibility of comparing them and, then, of analyzing the existence of some inconsistencies of this type.

Accordingly, the main contribution of our study is that it assumes to put face to face the three dimensions of sustainability in a specific context and to observe the manner in which the components of economic and social wellbeing influence the environmental wellbeing, focusing on the major differences among these relations and also including in the discussion the stage of national development. Through doing this, while observing the presence of inconsistences in the dynamics of sustainable development dimensions, we also conclude regarding the two well-known development models and their level of implementation in this group of countries. In this way, we consider that these kind of inconsistencies may be seen as markers for not following a sustainable path in a certain context. Moreover, as it is clearly that it is still sufficient place for improvement in terms of sustainability goals, identifying the negative influences of economic and human components on environment may represent specific directions of actions for alleviating them.

The paper is structured as follows: Section 2 reviews some approaches on sustainable development concept. Section 3 is dedicated to the data and methodology used for analyzing the main economic and social determinants of environmental wellbeing. Section 4 illustrates and discusses the main empirical results. The study ends with a series of concluding remarks and references included, in Section 5.

Different Directions of Thinking in the Sustainable Development Theory

The concept of sustainable development is an attempt of bridging the gap between environmental and socio-economic concerns about human development issues [12] (p. 370), aiming at simultaneously achieving economic growth, environmental protection, and equity [13] (p. 156). Although this goal is unobjectionable in its respect, the possibility of its achievement is frequently put into discussion in the academic literature, observing different points of view regarding it and, accordingly, the entire theory of sustainability. Thus, for a general understanding, considered as useful in our next steps within this paper, we intend to point out and analyze some relevant ideas according to these different positions.

Firstly, referring to the favorable position, we start with the expression (remarking its sonority) used by Lafferty and Langhelle [14] for emphasizing the importance of the sustainable development theory, considering it as "an ethical code for human survival and progress". More, it is assumed that it may be compared to "other high-minded ideas such as democracy, freedom and human rights" [15] (p. 205). Our present societies, as Friedman [16] (p. 40) mentioned, have built a very inefficient environment with the major efficiency met by generations along time. The so-called "productivist society", where growth and economic activity have long been the central focus of individuals and communities' actions [17] (p. 79), negatively affects environmental quality [18-21] (p. 125). In response, over the last decades, the efforts made for promoting sustainable development have been more evident and proved to have some reverberation especially within the most developed societies. Taking into consideration the higher awareness expressed by assertions that (1) "human and natural worlds need integration" [22], (2) "today's environmental problems are increasingly complex" [23] (p. A43) and represent a "threat" to human wellbeing [5, 24, 25], the tendency to pay greater attention to the environment is sustained and encouraged by both theoreticians and practitioners. As (once) an inspiring and (now) a traditional response, Norgaard [26] emphasizes the concept of co-evolution, as "the constant and active interaction between a living organism and its environment", considering the environment and society, with its economic and social dimensions, as two intimately co-evolving systems [27] (p. 57). In this way, sustainable development is seen as an alternative to conventional development, oriented only towards growth [14-16, 28-30]. Based on the co-evolution concept, the supporters of sustainable development continue to consider reforming of institutions as the main solution for improving the three dimensions of sustainability [31] (p. 260).

Apart from them, there are voices that adopt a contrary position and consider that reconciliation of the economic, social and environmental dimensions of sustainability is not possible to be put into practice, although it may be desirable [13, 12, 32, 33]. In support of this position, Robinson [12] points out the problem of squaring the circle, tried to be solved since the ancient Greece and proved to be without solution almost 2000 years later by Ferdinand von Lindemann, as a metaphor for describing an impossible task, appropriate to be used in the context of sustainable development, and emphasizing the utopic position of those promoting it. From a more sympathetic critic perspective, the anthropocentric character of sustainable development theory is also frequently highlighted in literature [12, 13, 31, 33]; the fact that focus is not put on environment, but on economic and human dimensions, represents the general explanation of theory's incapacity of practically solving the environmental stringent pressure. In this way, critics of the mainstream position advocate for more

radical societal changes, and have, as Sneddon et al. [31] (p. 260) mention, comprehensively and incisively deconstructed sustainable development's basic contradictions.

In this context, in spite of the different points of view regarding the sustainable development theory, it is certain that economic development has allowed for advances with fundamental change in the ways humans live, compared to the previous centuries, even if such progress has also been made with expenses materialized into potentially dramatic consequences [17] (p. 15). Thus, increasing the concerns on the major vulnerable issues of sustainability is imposed by the realities of our days, which appear as continuous alarm signals at different levels (starting from the environment and continuing with moral values, poverty, consumerism etc.), transmitting that the chosen paths are not the correct ones [1, 7, 16, 19, 34, 35-38].

Observance of these signals, especially of those coming from the environment, permits the assumption that individuals and, consequently, societies are blocked in a sort of path dependency because, although the negative consequences of human actions on environment are confirmed (for example, [18-20, 25, 30]), passing off this direction, in the context in which the majority follows on the same way, is difficult or even almost impossible without increasing the general awareness and commune involvement. To this end, quoting the words of Strange and Bayley [17] (p. 17), "it is time to learn how to develop without these negative social and environmental side effects, and in a way that benefits more of us" is suitable. Although this type of concern was more or less formed in time, practical application of its principles has proven to be anything but simple, clear or accessible. In this respect, an inevitable key question remains whether progress has been made, or whether the warnings have been seriously and sufficiently considered to allow confronting the most stringent problems within societies. This is why our paper attempts at understanding the main economic and social components that negatively affect environment, as major directions that have to be taken into account for correcting the negative impacts upon it.

Based on these concerns regarding sustainable development, our approach follows the main indicators of Sustainable Society Index [39] and also the three areas of capital used and developed for general wellbeing [11] (p. 8) described by the Belgian Federal Planning Bureau. Consequently, we will theoretically analyze the social and economic determining factors of environmental wellbeing focusing on their main peculiarities and also on the relations between them and the environment, revealed within some previous studies.

Economic Factors

(1) Organic farming

Organic farming represents one important potential contributor to environmental, economic, and social sustainability [40] (p. 1), and is often perceived to have beneficial impacts on the environment, compared to conventional farming [41-45]. Thus, it is gaining recognition as a relatively friendly production system and, as Hansen et al. [46] (p. 11) remarked, in general, the risk of harmful environmental effects is lower with organic than with conventional farming methods, though not necessarily so. In this regard, the meta-analysis elaborated by Tuomisto et al. [47] has shown that organic farming in Europe has generally lower environmental impacts per unit of area than conventional farming but, due to lower yields and the requirement to build the fertility of land, not always per product unit.

(2) GDP

Gross Domestic Product (GDP) represents the most widely accepted and used measure of a country's economic progress, measuring the market value of goods, services, and structures produced by nation's economy in a particular period [48] (p. 2). The most common approach is to analyze the linkage between national income and the measures of environmental quality from the inverted U-shaped relationship, with environmental degradation that increases with income at low levels of income and decreases with income at high levels of income [49-52]. More, the resistance to reduce the role of economic growth in sustainable development is a major barrier against sustainability [53-55].

(3) Genuine savings

Based on the idea of wealth accounting [56], Genuine Savings (GS) illustrates the manner in which the national total capital stock, comprising the assets from which people obtain wellbeing, changes within a year [57] (p. 779). Its approach corresponds to the so-called weak sustainability [57, 58], emphasizing how the different forms of capital combine in order to produce a stream of wellbeing over time and to maintain functioning of the economy-environment system [57] (p. 779). In other words, as Van de Kerk and Manuel [39] mention, Genuine Savings or Adjusted Net Savings measures the true rate of savings in an economy after taking into account investments in human capital, depletion of natural resources and damage caused by pollution.

(4) Employment

As Lawn [59] (p. 13) mentions, the best definition given to full employment is the one that describes it "as a situation in which the economy is able to generate sufficient paid work to eradicate all forms of unemployment, except frictional unemployment, as well as eliminate underemployment".

On the other side, unemployment is a harmful factor for general wellbeing, also affecting the environmental one, contributing in a significant manner to the assessment of quality of life and increasing inequality [60-62], its persistence leading to many other types of deprivation [60] (p. 3). This economic component is usually related to environmental taxes, with an inverse relationship between them [63, 64].

(5) Public debt

Public debt has the capacity of influencing the national economic progress over the short-run, but also inducing long-term repercussions. According to the conventional view, the debt in terms of deficit financing may stimulate aggregate demand and output over the short-run, but registers opposite effects over the long-run [65] (p. 5). These negative effects of (especially high) debt are related to capital [66], (future distortionary) taxation [67], inflation [68], and greater uncertainty about prospects and policies [65]. Moving on and addressing the link between public debt and environment care, it was shown that a high public debt may constitute a constraint on environmental preservation [69, 70]. Being dependent on the future decisions of agents and also correlated to each other, the trade-off between environmental quality and public debt reduction depends on how people value the future [70] (p. 267).

Social factors

(1) Sufficient amount of food

Sufficient food indicator refers to the availability of at least a minimum level of dietary energy for each person, being one of the basic conditions for a proper personal development [39].

In this way, it represents a first means of expanding the real freedom that people enjoy [61] (p. 3), being challenging especially in factor-driven economies [71, 72], characterized by high levels of poverty and not very favorable environmental conditions. As a consequence, in the third world, the relationship between environmental quality and basic needs, including sufficient food concern, is generally negative [73, 74].

(2) Sufficient amount to drink

Water, as one of the most critically stressed resources [75-77], represents, next to sufficient food, a necessity for survival and also for development. It depends on the spatial variability and temporal fluctuations in supply and demand, not always conforming to the patterns of human demand [75] (p. 264), which determines the importance of its measuring in terms of sufficiency. In this context, sufficient water is evaluated as at least 20 liters of safe drinking water per person per day, that should be available within one kilometer of a user's dwelling, from an improved water source, including: household connections, public standpipes, boreholes, protected dug wells, protected springs and rainwater collection [39].

(3) Safe sanitation

Safe sanitation is another decisive component of quality of life, with great impact on individual state of health. It refers to the collection, transport, treatment and disposal or reuse of human excreta or domestic wastewater, supported by collective systems or installations serving a single household or undertaking through improved water disposal facilities [39]. The lack of safe sanitation increases the risk of population's contamination with infectious diseases [78-81], decreasing the life quality and contributing to poverty, as a main determinant factor. Apart from these negative aspects, it also represents a pollutant factor, damaging environmental wellbeing [82].

(4) Education

With its main scope of forming and improving the competences of labour force, education contributes to personal and societal development, being itself an increasingly valued asset within all societies [83] (p. 12). When analyzing the link between education and environment, the findings generally show a positive effect of a higher level of education on pro-environmental attitudes [25, 84-89]. In this paper, education is analyzed considering the number of students enrolled in primary, secondary and tertiary levels of education, regardless of age, as a percentage of the population of official school age in the three levels [39], for understanding if pressure on environment comes from this point of view.

(5) Healthy life

The state of personal health is closely linked to individual capabilities, apart from the aspects regarding income and education [61] (p. 19), its absence being connected to vulnerability, risk, powerlessness, lack of voice and low environmental concern [90]. Commonly, as van de Kerk and Manuel [39] mention, the level of a country's health care is measured using life expectancy at birth at national level [91]. As McMichael [92] (p. 100) suggests, it may be eroded as environmental degradation and disruption become more widespread and severe. More, according to Ristevski and Malichi [93] (p. 95), the right to a healthy living environment is part of the function of the right to life. Therefore, without accomplishing the right to a healthy environment, the right to a healthy life could not be exercised. In this context, it can be observed that the link between environment and individuals' state of health are intimately linked. The most common sense of analyzing the relationship between them is from the environment to health [94-98]. In our paper, we intend to observe the opposite sense, i.e. the influence of life expectancy at birth at national level on environmental wellbeing.

(6) Gender equality

The problems related to gender gap still exist and can be divided into two distinct parts: the political-economic part and the cultural-valuational one [99] (p. 25). Attaining a certain level of equality in terms of gender is beneficial for the general goal of personal and general development [88, 100-103]. As to its effects on environment, the findings are not unitary, indicating, for example, that gender plays an important role in shaping determinants of pro-environmental behavior [104, 105] or that females are more disposed to invest their time for participating to environmental activities than men [106], or that the influence of gender is weak and inconsistent [102, 107, 108].

(7) Income distribution

The inequality of income tends to represent "the primary focus of attention in the analysis of inequality" [109] (p. 28). The Keynesian argument related to the influence of inequality on economic development explains why a moderate income distribution within society is socially desirable, while the high one, especially that coming from patrimony, is harmful for development [110] (p. 149). Analyzing the results obtained in studies that investigated the relationship between income inequality and environment, one may observe that they differ, being even contradictory in some cases. In this way, it can be negative, meaning that (1) higher inequality increases the rate of environmental time preference, reducing the concern for the future and degrading more the environment [92, 111-115], or that (2) an unequal income distribution leads to less stringent environmental policies [116]. In other cases, it appears unclear or ambiguous in terms of relative impact of rich and poor people on the environment [117], explained by the fact that (1) income distribution is not related to environmental degradation, as Scruggs [118] argued, or that (2) the positive and negative influence of income inequality on the environment tends to counterbalance it [119] (p. 21).

(8) Population growth

The relationship between population growth and environmental quality has drawn the attention of economics since its first theoreticians. In the actual context of analysis, the neo-Malthusian and neo-Boserupian approaches play an important role, as they represent the two main and contradictory theoretical directions in the population-environment debates, providing divergent opinions about the effects of population growth on the environment [120] (p. 171). As a component of human wellbeing, population growth, translated into more inhabitants on earth, means a larger demand for the limited available space and other resources on our planet, many of the latter not being renewable [39]. In this way, nowadays it is generally perceived as a pressure on environmental wellbeing [121-124].

(9) Good governance

Good governance is on the list of the most decisive points in the process of development [125], including the environmental policy. In this way, poor government and regulatory policies are highlighted, among other factors, as "significant hindrances to environmentally (…) responsible behavior" [25] (p. 63), but also in [18, 30, 92, 126, 127, 128]. It represents an umbrella term denoting lasting and positive changes in accordance with the six key principles [126] (p. 138) regarding: (1) voice and accountability of a country's citizens; (2) political stability; (3) government effectiveness; (4) regulatory quality; (5) rule of law; (6) corruption [39, 91].

Material and Methods

We focused our empirical analysis of sustainable development across 12 Central and Eastern European countries using data collected in the 2006-2016 period. The selection of countries was based on the classification provided by the Organization for Economic Co-operation and Development [129]. The countries included in the study were: Albania, Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. The motivation of taking into analysis this group of countries was firstly the fact that all of them are currently in a developing process, attempting to attain the economic and social performances of the Western European countries and, secondly, by their approximately similar national characteristics.

In detail, given the common past of these countries under the communist regime, their level of development was similar to some extent until the beginning of the 90's, after which, in close relation with their ascension to the European Union (Czechia, Poland, Lithuania, Latvia, Estonia, Slovakia, Slovenia, and Hungary joined European Union in 2004, Bulgaria and Romania joined it in 2007 and Croatia in 2013), they have had to face the challenge of sustainable development. In this respect, the CEECs have to develop a better quality of life, a cleaner environment, and a higher level of economic activity. Reality showed that this challenge was generally hard to be fulfilled and also seriously hindered by the socio-economic problems caused by the global crisis of 2009-2010: relatively high unemployment rates, progressive emigration of the population, relatively low purchasing power of households, the inadequate quality of legislation, inefficient environmental protection standards etc. [130].

The purpose of the study was to analyze and present the position of CEECs in the context of sustainable development concept implementation in the 2006-2016 years, focusing on environmental wellbeing, analyzed in relation to the other two components, the human and economic ones.

In order to conduct a more accurate and detailed analysis, we classified the CEECs based on their level of competitiveness according to The Global Competitiveness Report 2016-2017 [131] into 3 stages, as follows: stage 2 of the efficiency-driven countries (Albania, Bulgaria, and Romania), stage 3 of the innovation-driven countries (Czechia, Estonia, Slovakia, and Slovenia), and stage 2-3 of the transition countries between the previous two stages (Croatia, Hungary, Latvia, Lithuania, and Poland).

The data were collected from the Sustainable Society Index official website, which reports the relevant indicators every 2 years between 2006 and 2016. Starting from data's availability, we extended the analysis over the entire period. For the years with no

Table 1. The SSI framework.

SSI dimensions	SSI categories	SSI indicators	Source
1. Human Wellbeing	1. Basic Needs	1. Sufficient Food	FAO FSI
		2. Sufficient to Drink	
		3. Safe Sanitation	
	2. Personal Development & Health	4. Education	UNESCO
		5. Healthy life	WHO HALE
		6. Gender Equality	WEF
	3. Well-balanced Society	7. Income Distribution	WB
		8. Population Growth	
		9. Good Governance	
2. Environmental Wellbeing	4. Natural Resources	10. Biodiversity	Protected Planet
		11. Renewable Water Resources	FAO Aquastat
		12. Consumption	GFN
	5. Climate & Energy	13. Energy Use	IEA
		14. Energy Savings	
		15. Greenhouse Gases	
		16. Renewable Energy	
3. Economic Wellbeing	6. Transition	17. Organic Farming	FIBL
		18. Genuine Savings	WB
	7. Economy	19. Gross Domestic Product	IMF
		20. Employment	WB
		21. Public Debt	IMF

available data (2007, 2009, 2011, 2013, and 2015) we replaced the missing values by calculating the mean values from the previous and subsequent year.

Our decision to use the Sustainable Society Index (SSI) instead of other indices, such as the Index for Sustainable Economic Welfare (ISEW) [132], Environmental Performance Index (EPI) [133], Ecological Footprint (EF) [134] or Human Development Index (HDI) [135], was based on 3 motivations. The first refers to the fact that SSI comprises a large set of indicators taking into consideration the three components of sustainable development in a society: economic, human, and environmental wellbeing. The second motivation that led us to consider the SSI was that the 21 indicators forming the framework come from a wide and reliable number of sources (Table 1). The third motivation came from the fact that, in 2010, SSI was confirmed by the Joint Research Centre of the European Commission as an index "well-structured and guaranteeing a control process to ensure transparency and the credibility of the results" [136].

As already mentioned, the SSI is based on 21 indicators grouped into 7 categories and 3 dimensions, as shown in Table 1.

According to Van de Kerk and Manuel [137], the SSI scores are calculated via the geometric mean (Eq. 1) as follows:

$$SSI_l = \prod_i \prod_j \prod_k (d_{ijkl})^{a_i b_{ij} c_{ijk}} \quad (1)$$

...where l represents the country, i represents the wellbeing dimension, j represents the category, k represents the indicator, d_{ijkl} represents the sustainable society score of country l with respect to indicator k, a_i is the weight of the wellbeing dimension i, b_{ij} is the weight of category j, and c_{ijk} is the weight of indicator k.

The values of SSI indicators have a range of variation between 0 and 10. If a country i is 100% sustainable for indicator k, it will be scored with 10. Otherwise, if the country i is no sustainable at all for indicator k, it will be scored with 0. Given the equation above, the values of SSI categories and wellbeing dimensions have the same range of variation, 0-10, 0 referring to the case of no sustainability and 10 referring to the case of complete sustainability.

As mentioned before, our study focuses on analyzing the environmental wellbeing in relation to human and

economic wellbeing in CEECs in the 2006-2016 period. Firstly, we want to detect any possible inconsistencies regarding the evolution of the three dimensions of sustainable development. To this end, we plotted their dynamics in order to identify the existence of some trends in their evolution and also of any possible gaps among the countries in different stages of development. Secondly, starting from the main conclusions derived from descriptive analysis in terms of significant differences between efficiency-driven and innovation-driven economies, on one hand, but also among the environmental, human and economic wellbeing at general level, on the other hand, we used panel data specific methods for understanding the source of such differences.

Panel data refers to a dataset that contains time series observations for a number of individuals. A panel has the following form: X_{it} (i = 1, i … N; t = 1, t …T), where i is the individual dimension (i.e. cross section) and t is the time dimension.

Panel data analysis was conducted in four steps. In the first one, we estimated the pooled OLS (POLS) model, the fixed effects (FE) model and random effects (RE) model in order to analyze the influence of the economic and human wellbeing indicators upon the environmental wellbeing dimension.

The impact of economic (Eq. 2) and human (Eq. 3) wellbeing indicators on the environmental wellbeing dimension can be estimated through the following equation:

$$Environmental\ Wellbeing_{it} = \beta_0 + \beta_1 Organic\ farming_{it} + \beta_2 Genuine\ savings_{it} + \beta_3 GDP_{it} + \beta_4 Employment_{it} + \beta_5 Public\ debt_{it} + \varepsilon_{it} \quad (2)$$

$$Environmental\ Wellbeing_{it} = \beta_0 + \beta_1 Sufficient\ food_{it} + \beta_2 Sufficient\ to\ drink_{it} + \beta_3 Safe\ sanitation_{it} + \beta_4 Education_{it} + \beta_5 Healthy\ life_{it} + \beta_6 Gender\ equality_{it} + \beta_7 Income\ distribution_{it} + \beta_8 Population\ growth_{it} + \beta_9 Good\ governance_{it} + \varepsilon_{it} \quad (3)$$

...where i denotes the country subscript; t is the time period; β_0 is the constant; β_j is the coefficient related to different types of variables; and ε_{it} is the error term. Regarding the i subscript, we used three samples: (1) 12 Central and Eastern European countries; (2) 3 countries corresponding to stage 2 (efficiency-driven); (3) 4 countries corresponding to stage 3 (innovation-driven).

In the second step, we applied the following tests to identify the most suitable model for our data: Chow test for choosing between the POLS and FE model [138], Breush-Pagan test for choosing between the POLS and RE model [138], and Hausman test for choosing between the FE and RE model [139].

In the third step, for the model selected in the previous step, we checked the following hypotheses in order to validate it: independence, homoscedasticity, autocorrelation, and multicollinearity. As not all these hypotheses were attained, in the last step, we estimated a corrected model.

Taking into consideration that the number of periods (10) is higher than the number of countries (3 in stage 2 and 4 in stage 3), we applied the Feasible Generalized Standard Squares (FGLS) model [140]. This model (Eq. 4) has the following general form [141]:

$$w_{it}Y_{it} = w\alpha + w_{k,it}\sum \beta_k X_{k,it} + w_{it}u_{it} \quad (4)$$

...where i represents the country, t represents the period, k represents the index of the independent variable, w represents the weights for each of the components in the model, Y_{it} is the dependent variable (score of the environmental wellbeing dimension) for country i and period t, X_k is the independent variable (scores of the human and economic wellbeing indicators) for country i and period t, α and β_k represent the coefficients of the model, u_{it} represents the error model.

Results and Discussion

The assertions discussed in the literature section, especially the ones regarding the practical state-of-fact of the possible reconciliation among sustainability dimensions, may be investigated and even possibly certified by analyzing the evolution of CEECs in terms of economic, social and environmental wellbeing indicators. Moving on, paying attention to the fact that the environmental dimension registers the lowest levels and also that the sustainability concept was created mainly for integrating the environment within the other two dimensions for more properly protecting it, we analyze the main determinants of environmental wellbeing in relation to (1) human wellbeing and (2) economic wellbeing components in the CEECs. More than that, as this group is composed of countries belonging to different stages of development (stage 2: efficiency-driven economies; transition from stage 2 to 3; stage 3: innovation-driven economies), we considered beneficial to observe the general situation of the entire group, but also the differences between the two main stages of development (i.e. stage 2 versus stage 3) in terms of economic and social determinants of environmental wellbeing. This comparison is made for a better differentiation of the influence of these factors that may conduct to its deeper understanding in the CEECs.

Descriptive Analysis

Analyzing the evolution of economic wellbeing (Fig. 1), firstly, a preponderantly ascendant trend

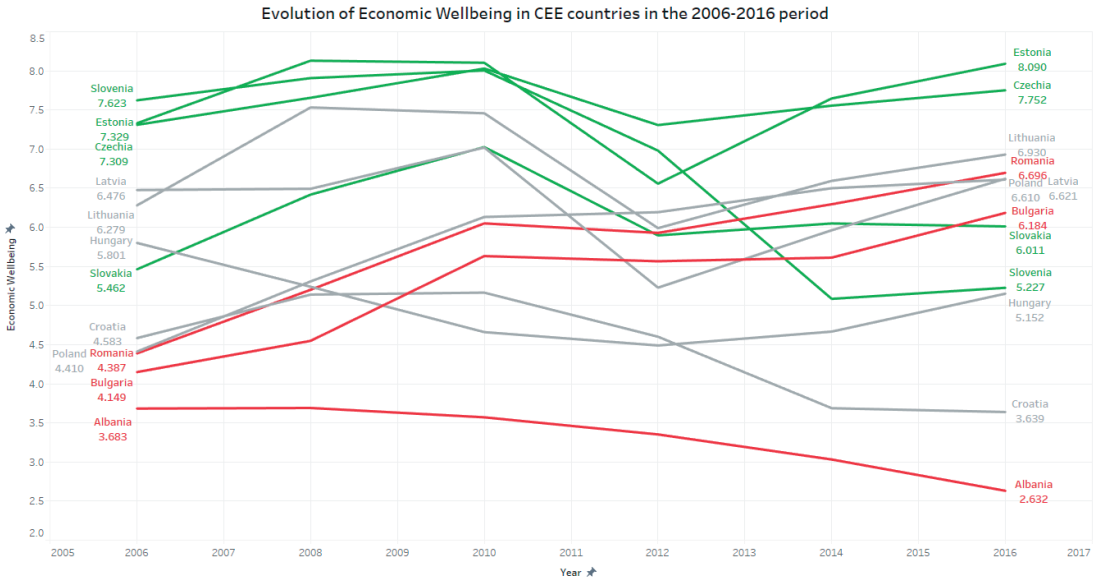

Fig. 1. Economic Wellbeing in CEECs, divided in stages of development, between 2006-2016.
Source: SSI database, computed in Tableau Public 10.3

may be observed for all stages of development (stage 2 – marked in red color; transition from stage 2 to stage 3 – marked in grey color; stage 3 – marked in green), meaning that all countries from the analyzed group tend to improve their levels of economic status in the 2006-2016 period.

A second observation is that the efficiency-driven economies (Albania, Bulgaria, Romania), that are part of stage 2 of development, register lower levels compared with the countries from the last stage of development, based on innovation (Czechia, Estonia, Slovakia, Slovenia).

Thirdly, another observation is related to the fact that, looking at the 2006 year, the economic national status is well-delimited as a function of the development stages. In other words, the economies from the last stage register significantly higher levels of economic wellbeing (between 5.5 and 8) than the ones from the second stage (between 3.5 and 4.5). This situation was maintained until 2012, when the dynamics of the analyzed indicator started to evolve in different ways in most of CEECs, the economies from the second and last stages of development overlapping their positions in terms of economic wellbeing (for example, Romania and Bulgaria from the second stage compared to Slovakia and Slovenia from the third one).

As to social wellbeing (Fig. 2), a clear delimitation can be observed between the two stages of development,

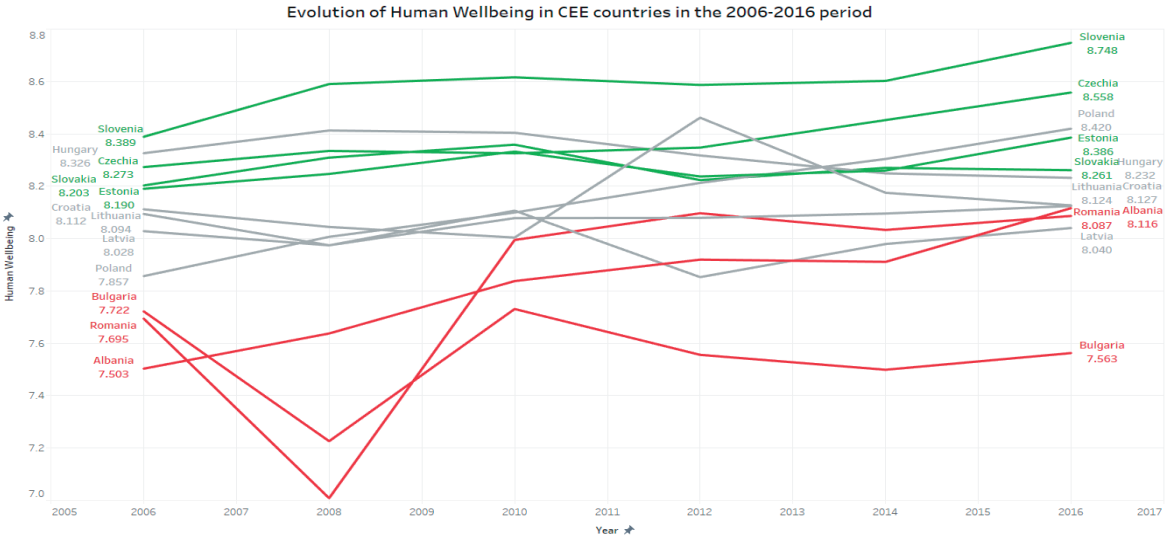

Fig. 2. Human Wellbeing in CEECs, divided in stages of development, between 2006-2016.
Source: SSI database, computed in Tableau Public 10.3

with a significant difference between their levels. While the efficiency-driven economies have lower levels, between 7 and 8.2, the innovation-driven ones record levels between 8.3 and 8.8. Both stages 2 and 3 register an ascendant trend, yet variation in the last stage is reduced comparatively to the other stage. Exception is made by Bulgaria, that registers lower levels in 2016 (equal to 7.563) compared to 2006 (equal to 7.722).

Also, during the crisis, the most affected countries are the ones from stage 2, especially the two countries belonging to the European Union (Bulgaria and Romania), that recorded in 2008 the highest downturn among all CEECs in all analyzed years, revealing their high weakness to different potential perturbing factors.

Compared with the other two components of wellbeing, the situation in the case of environmental one (Fig. 3) is wholly different, as the countries from the second stage of development generally register higher levels than those belonging to the last stage. The graph plotted in Fig. 3 illustrates the distinct position of each country, induced by the type of its economy. The ones based on innovation tend to have lower levels of environmental wellbeing (between 2 and 4.5) compared to the economies based on efficiency (between 3.9 and 6).

Another observation involves the comparison among the three components of wellbeing and their levels in the analyzed group of countries along the 2006-2016 period. In this respect, taking into consideration that the lowest level of human wellbeing of all countries, over the entire period of time taken into analysis, is equal to 7.000 (in the case of Romania, in 2008), the other two components of wellbeing, economic and environmental, register significantly lower levels comparatively to the human one: (1) the lowest level of economic wellbeing is the one of Albania, equal to 2.632 in 2016 and (2) the lowest level of environmental wellbeing is the one of Estonia, equal to 2.052 in 2006. This means that the human component is on the correct and closer direction to what represents a sustainable society, the other two components needing to considerably improve their levels in order to reach this desideratum of sustainability. These observations confirm our first hypothesis - (H1): The economic, social and environmental dimensions of sustainability register a different evolution in the CEECs in the 2006-2016 period.

Moreover, it can be also observed that these components have different evolutions, a special observation being that, when the economic level grows, the environmental one decreases. In this way, our second hypothesis - (H2): As the economic and social dimensions improve their levels, the environmental one tends to diminish its level in the CEECs in the 2006-2016 period – is confirmed; for better understanding such general assumptions and having in the center of analysis the environment, our subsequent endeavor aims at observing the relations between, on one hand, environmental wellbeing and, on the other, economic and human wellbeing in order to validate our two next hypothesis.

Empirical Analysis

Economic Factors

As theoretically introduced in the above section, the main economic determinants taken into analysis for

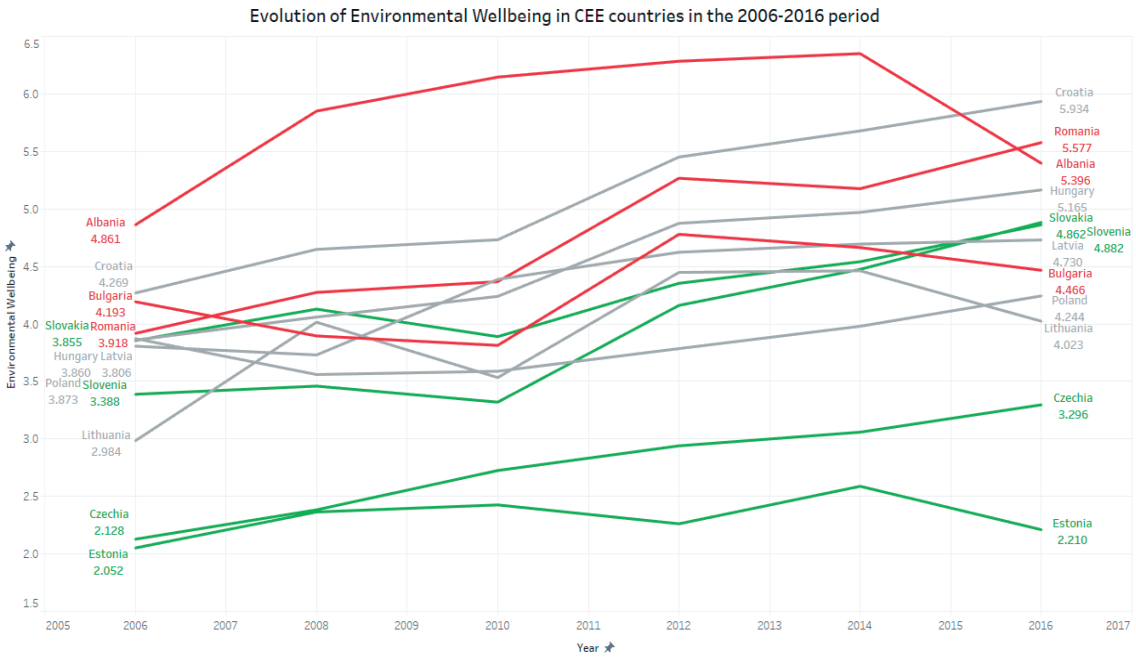

Fig. 3. Environmental Wellbeing in CEECs, divided in stages of development, between 2006-2016.
Source: SSI database, computed in Tableau Public 10.3

Table 2. The relations between environmental wellbeing and the components of economic wellbeing in stages 2 and 3, but also at general level.

		Dependent Variable: Environmental Wellbeing		
		General	Stage 2	Stage 3
Economic wellbeing	Organic farming	- 0.117 *** (0.032)[a]	0.099 (0.093)	- 0.418 *** (0.092)
	Genuine savings	- 0.099 ** (0.039)	0.129 *** (0.040)	- 0.313 *** (0.088)
	GDP	- 0.124 (0.088)	0.051 (0.131)	0.493 ** (0.230)
	Employment	- 0.177 *** (0.046)	0.043 (0.076)	- 0.143 ** (0.062)
	Public debt	- 0.167 *** (0.020)	- 0.333 *** (0.038)	- 0.206 *** (0.034)
	(Constant)	8.444 *** (0.555)	5.794 *** (0.708)	7.600 *** (1.883)
	Wald χ^2	244.35 ***	178.05 ***	194.94 ***

Notes: a denotes the standard error specific to each coefficient from the FGLS regression models. ***, **, * denote the statistical significance at 1%, 5% and 10% level.
Source: SSI database, computed in StataMP 13.0

understanding their relationships with environmental wellbeing are: (1) Organic farming; (2) GDP; (3) Genuine savings; (4) Employment; (5) Public debt (Table 2).

(1) Organic farming

Organic farming registers a significantly negative influence (of 1%) on environmental wellbeing in the countries belonging to the third stage of development (-0.418) and, also, at general level (-0.117), when all countries are taken into analysis. Although its influence was expected to be insignificant or, desirably, positive, its growing levels neither affecting nor positively influencing environmental wellbeing, our results show that these expectations are not confirmed, either in the case of the last stage of development, or at general level. Our results show a non-significant influence of organic farming upon environmental wellbeing only in the countries from the second stage, which may be explained in the context in which this type of farming is not very developed or extensively practiced in Albania (levels between 1-1.2 in the 2006-2016 period), Bulgaria (1.1-5.1), or Romania (2.4-4.6). However, when referring to the countries from the last stage of development, with higher levels of organic farming, such as: Czechia (8.0-9.4), Estonia (8.5-9.8), Slovakia (7.3-9.2), and Slovenia (7.3-9.0), the fact that this type of farming affects, as our findings reveal, the environmental wellbeing may be theoretically debatable. Taking into consideration other studies that reveal contradictory findings and also observing our results, it can be stated that the CEECs, especially the ones from stage 3 of development, with a higher level of organic farming, have to pay special attention to the manner in which they implement this type of farming. The fact that our findings showed a negative influence of organic farming on environmental wellbeing may constitute future research directions for establishing the causes and depth of this negative influence and what changes should be done for accomplishing the mission of this type of farming, implemented with the aim of protecting the environment.

(2) GDP

In the first model, when all CEECs were taken into analysis, GDP appears to be insignificant, as also for the countries from the second stage of development. The situation is different for the third model, the one of the innovation-driven economies, in which the relation between Environmental Wellbeing and GDP is significant and positive at a 5% level (0.493). Our results seem to support the theory of the inverted U-shaped relationship between environmental degradation and national income, being consistent with the ones of other studies (e.g., [52]).

(3) Genuine savings

Taking into account the comprehensive wealth [142] (p. 282) approach and analyzing the Genuine Savings or Adjusted Net Savings, we observed that, although, initially, GDP was shown to have a positive influence on environmental wellbeing in the last stage of development or, in other words, when a higher level of GDP translates into a higher level of environmental wellbeing, things prove to be different with this comprehensive indicator (i.e. Genuine Savings), its influence being negative. In this regard, we observe that, when investments in human capital, depletion of natural resources and damage caused by pollution are taken into account, the results show opposite effects. We also observe that a growing GDP is not sufficient to determine a sustainable economic growth because, when including into analysis the expenses at which

this growth is made, the influence on environmental wellbeing changes and becomes negative (-0.313), showing that it is still made at the expense of the environment. On a general level, the same situation may be recorded (-0.099). On the contrary, in the second stage of development, the influence is positive (0.129) and significant (1%).

(4) Employment

Our results show a significant and negative relationship between the level of employment and environmental wellbeing for Model 1 (-0.117) and 3 (-0.143). Thus, at general level, in the case of all CEECs, and also for the ones based on innovation, a higher level of employment seems to be harmful to the environment. This finding comes to confirm the major concern established within the book of Lawn [59] regarding the potential conflict between the goals of ecological sustainability and full employment. More, even if present in all CEECs, it has a more pronounced character within the developed societies, thus constituting a great challenge that needs rapid responses.

(5) Public debt

In all our three models, the relationship between public debt and Environmental Wellbeing is negative and significant at a 1% level (-0.167 for Model 1, -0.333 for Model 2, and -0.206 for Model 3). The pressure exerted by higher public debts influences in a negative way environmental quality. This is another reason for which the nations should escape from the high levels of debt trap. Once established, it is difficult (1) to prioritize environmental protection against economic gains and (2) to direct funds to improve the quality of environment. In this way, the results of other papers, revealing that, apparently, a high public debt may be a constraint on environmental preservation [69, 70] are also confirmed in our study.

Social Factors

Theoretically presented in the above section devoted to them, the main social determining factors included in our analysis for a precise understanding of their influence on environmental wellbeing are: (1) Sufficient amount of food; (2) Sufficient amount to drink; (3) Safe sanitation; (4) Education; (5) Healthy life; (6) Gender equality; (7) Income distribution; (8) Population growth; (9) Good governance (Table 3).

(1) Sufficient amount of food

This variable was omitted from our three models because of collinearity. It can be observed that CEECs do not record problems regarding this indicator, its values being the highest (equal to 10 points) for all countries in all years taken into analysis. In this way,

Table 3. The relations between environmental wellbeing and the components of human wellbeing in stages 2 and 3, but also at general level.

		Dependent Variable: Environmental Wellbeing		
		General	Stage 2	Stage 3
Human wellbeing	Sufficient food	(omitted)[a]	(omitted)	(omitted)
	Sufficient to drink	0.727 ** (0.280)[b]	0.682 *** (0.193)	1.201 (6.518)
	Safe sanitation	0.529 *** (0.133)	- 0.394 *** (0.126)	- 5.005 (3.514)
	Education	0.314 *** (0.119)	- 0.295 ** (0.120)	0.444 (0.447)
	Healthy life	0.573 * (0.302)	3.931 *** (0.463)	0.809 (0.831)
	Gender equality	0.650 ** (0.305)	- 1.525 *** (0.382)	0.925 * (0.530)
	Income distribution	0.211 *** (0.045)	0.016 (0.030)	0.321 * (0.178)
	Population growth	0.585 *** (0.124)	0.146 (0.153)	0.117 (0.373)
	Good governance	-1.464 *** (0.152)	0.023 (0.255)	- 4.160 *** (0.766)
	(Constant)	-17.182 *** (3.413)	-17.270 *** (4.223)	48.656 (71.328)
	Wald χ^2	358.26 ***	548.00 ***	133.48 ***

Notes: [a] the variable was omitted because of collinearity. [b] denotes the standard error specific to each coefficient from the FGLS regression models. ***, **, * denote the statistical significance at 1%, 5% and 10% level.
Source: SSI database, computed in StataMP 13.0

the goal of societies, that of offering sufficient food, is completely achieved, in this respect the investigated group of countries being wholly on the sustainable path of development.

(2) Sufficient amount to drink

In the third stage, variations in the values of Sufficient to drink indicator are very low, almost absent, between 9.9 and 10. This means that countries from this stage of development register a very good capacity of assuring to their population sufficient fresh drinkable water, from improved water sources. In this context, its influence on environmental wellbeing proves to be insignificant.

The situation is different especially in the case of Albania (9.5-9.6) and Romania (9-10), where variations are higher and environmental wellbeing is positively affected by the availability of sufficient water to drink (0.682). The same type of influence is also registered when all CEECs are taken into analysis (0.727). In other words, in these two cases (at a general level and for stage two), a higher level of the capacity of nations to assure sufficient fresh drinkable water from improved water sources to their citizens means higher levels of environmental wellbeing. Otherwise, the environment is negatively affected by the actions performed for obtaining the needed quantity of water.

(3) Safe sanitation

The relationship between environmental wellbeing and safe sanitation is significant in the economies based on efficiency (-0.394), but also at general level (0.529). The main reason is that, in the last stage of development, along all eleventh analyzed years, the levels of Safe sanitation is very high, with values between 9.7-9.9 and, consequently, low variation between them. In the countries based on efficiency, variation is higher, with values between 7.9 and 9.3. Also, at general level, the Safe sanitation indicator is evaluated between 7.5 and 9.9 points. Also observed is the different sense of influence when the relationship proves to be significant. If, in stage 2 of development, it is negative, at general level it is positive, a result showing that, in stage 2, offering the proper conditions regarding sanitation is still made at the expense of the environment. In other words, especially in this group of countries, greater attention should be paid to the manner in which the collection, transport, treatment and disposal or reuse of human excreta or domestic wastewater is managed, and to finding the most appropriate solutions to combat the negative effects upon the environment.

(4) Education

The number of students enrolled in primary, secondary and tertiary levels of education, as the percentage of the population of official school age for the three levels is significant in the case of stage two (-0.295) and also at general level (0.314). The opposite mode of influence in the first and second models is also observed here, when the relationship between education, described as above, and environmental wellbeing is analyzed. If, on a general level, the number of students enrolled in the three levels of education influences the level of environmental wellbeing in a positive way, in stage two, the influence is a negative one, education being still made by sacrificing the quality of environment.

(5) Healthy life

In terms of healthy life levels, although the differences between the second stage of development (with levels between 7.3 and 8.1) and the third one (with levels between 7.5 and 8.5) are not high, different influences can be observed in the three applied models. Thus, the relationship between healthy life and environmental wellbeing is positive and significant in the first two models (0.573 in Model 1 and 3.931 in Model 2) and insignificant in the last one. Therefore, when the relation is significant, it is shown that offering higher levels of health contributes to higher levels of environmental wellbeing.

(6) Gender equality

Gender equality has a significant influence within all three models (0.650 in Model 1, -1.525 in Model 2, and 0.925 in Model 3). The difference is observed in the sense of influence, that is (1) positive in the last stage of development and also for all countries taken into analysis and (2) negative in the second stage. In other words, although offering a higher level of gender equality contributes in a beneficial way to improving the environmental quality in two of our three applied models and also from a theoretical perspective, in stage two of development, when three economies based on efficiency are analyzed, such higher levels seem to negatively affect the environment.

(7) Income distribution

Income distribution has a positive and significant influence at 10% level, in all CEECs (0.211), in stage three of development (0.321) without including the stages of development under discussion. Assuming that a higher level of equality is beneficial for the progress of a society, it is shown that it is also nurturing for environmental wellbeing. This means that, if the wealth of a nation is not heavily accumulated in the hand of few people, it may represent a positive determinant for a more attentive and efficient care on both environmental resources and climate and energy protection.

(8) Population growth

The negative population growth, i.e. a decreasing number of inhabitants instead of a continuous and rapid population growth, we nowadays are facing in many countries, seems to have a positive and significant impact at a 1% level on environmental wellbeing when all CEECs are included into analysis (0.585). We observe that countries generally register high values of this indicator (between 7 and 10), thus being on the sustainable path, and also that, in stage three of development, contrary to our expectations, these values are lower compared to the ones of the second stage.

(9) Good governance

As our results reveal, the influence of good governance is significant in the last stage of development

(-4.160) and at general level (-1.464), but negative in relation to environmental wellbeing. It is obvious that the government still does not sufficiently concentrate on the environment dimension, since the relation between it and environmental wellbeing is negative. These findings help us conclude that the way of governing within especially the innovation-driven economies, but also at general level, in the case of CEECs, is still predominantly traditional, much more oriented towards economic results than towards environmental protection. Consequently, as such phenomena appear even in developed countries, the development policies related to consumption, energy use and greenhouse gases should be more carefully oriented towards their protection. In this context, a higher level of environmental concern is required even within or, especially, in the case of public servants, who have the moral obligation of avoiding the waste of national natural resources. Our result is consistent with the one of Seifi and Stratan et al. [30, 143].

Starting from these results, we have to firstly mention that our approach sustained the concept of development seen as a complex, large and continuous process, based on multiple interactions between different components that influence each other, with the main scope of improving wellbeing. More, referring to the sustainability approach, nearby society, with its two major parts, i.e. economic and social ones, environment and its protection become of prime interest and careful analyses have to be employed for addressing this concern while also having into consideration the support for social and economic progress. Following the more-oriented to environment perspective, we investigated the dynamics of the three dimensions of sustainability and the influence of human and economic components on environmental wellbeing. Accordingly, we had as a starting point the well-known assumption, based on different studies from the literature [1-3, 9, 16-17, 26], that obtaining acceptable levels of economic and social dimensions, concreted into adequate standard of living for individuals generally assumes to sacrifice, to some extent, the environment. The major components of the social and economic dimensions were taken into account and analyzed in relation to environmental wellbeing for observing their type of influence, offering, in this way, a large perspective regarding these relations that in other studies were individually investigated. Thus, firstly, referring to the relation between economic and environmental wellbeing, main conclusions may be synthetized as follows:

(1) Organic farming was shown to have a negative influence on the environment wellbeing in the countries from the third stage of development, but also on the general level, this result coming to complete other contradictory findings in this respect, like the ones put into discussion by Tuomisto et al. [47], that mention the opposite conclusions that might be formulated in the case of choosing to refer either to the impacts per unit of area or to product unit.

(2) GDP was found to be significant and positive in relation to environmental wellbeing in the case of innovation-driven economies, supporting at some point the theory of inverted U-shaped relationship between environmental degradation and national income, being consistent with the results of other studies [52].

(3) It was, in addition, shown the fact that a growing GDP is not sufficient for determining if economic growth is on a sustainable path. In this respect, when also including the expenses of growth for maintaining the functioning of the economy-environment system [57], measured through genuine savings indicator, the influence on environmental wellbeing becomes negative.

(4) Employment was found to be harmful for environmental wellbeing both on general level and in the countries from the last stage of development. These results come to confirm the major concern mentioned in the study of Lawn [59] in terms of potential conflict between environmental goals and employment. In contrast, they oppose to the ones from other studies [63, 64] that see unemployment as related to environmental taxes, with an inverse relation between them, and that, as an effect, might produce less financial support for environmental protection and, consequently, less environmental wellbeing.

(5) In the same rationale, it was shown that a high public debt constitutes a constraint on environmental wellbeing, the negative influence maintaining on general level, but also in the case of efficiency- and innovation-driven economies, confirming, in this way, other results from previous studies [69, 70].

Completing the perspective of main results, components of human wellbeing were also shown to be significant in relation to environmental wellbeing, as follows:

(1) In the groups of countries based on efficiency, we found that offering the proper conditions in terms of safe sanitation is still made at the expense of environment, having a negative relationship and confirming the results of other studies pointing on the fact that the lack of safe sanitation represents a pollutant factor [82].

(2) In addition to the above result, in terms of education, if, at general level, the number of students enrolled in the three levels of education influences the level of environmental wellbeing in a positive way, in the same stage two, the influence is a negative one, education being still made by sacrificing the quality of environment. It has to be mentioned that, while previous studies took into consideration the level of individual's education and showed positive effects on pro-environmental attitudes [25, 84-89], in our paper, this component was seen from the perspective of the number of students enrolled in education with the aim of observing the pressure on environment coming from it.

(3) Regarding the healthy life component, the most common sense of analyzing this relation is from environment to it [94-98]. We observed the opposite

direction of influence and found the fact that a good health status has a beneficial influence on environmental wellbeing – higher levels of health contributing to protecting more the environment.

(4) As observed in other studies, gender equality might play an important role in environmental protection, although its influence is not unitary understood [102, 104-108] and our results confirm this issue. More clearly, different senses of influence were observed in terms of national development stages, i.e. positive in the last stage and at general level and negative in the case of the second stage. It seems that, as societies develop, the gender equality perspective tend to increase its contribution in environmental wellbeing.

(5) Accordingly to our results, income distribution in relation to environment, as a largely discussed topic within the academic literature, seems to be significant in the case of environmental wellbeing. In other words, less income inequality seems to be translated into less environmental degradation, confirming, in this way, the results of other studies [92, 111-115].

(6) As also pointed out in previous studies [18, 30, 92, 126, 127, 128], according to our results, governance still does not sufficiently concentrate on the environment dimension, being still more oriented towards economic results than towards environmental protection. This is evidenced by the negative influence found while analyzing the relation between the two issues.

Conclusions

In this paper, analysis of the dynamics of the three dimensions of sustainable development between 2006 and 2016 in the Central and Eastern European Countries evidenced some inconsistencies both among them, but also among the levels of the same dimension, as a function of the stage of national development. In this respect, our results emphasized that the countries from stage 2 register lower levels of economic wellbeing than those from stage 3, yet the evolution trend is mostly ascending in both stages of development. Then, it can be stated that the two stages of development are clearly delimited in terms of human wellbeing levels along the entire analyzed period, the difference between them being significant. Besides this, the evolution trend is mostly ascending in both stages of development, but variation in the national levels of stage 3 is lower than that of stage 2. In terms of environmental wellbeing, contrary to the observed situation regarding the other two wellbeing dimensions, the countries from stage 2 register higher levels of environmental wellbeing than the ones from stage 3. More than that, the evolution of environmental wellbeing levels does not register a specific trend, whereas the stages of development appear to have an opposite situation over the analyzed period.

Secondly, adding to the above-mentioned results, the relationships between the environmental dimension, on one hand, and the components of the human and economic dimensions, on the other, were also analyzed, the nature of the influences of these factors upon environment being outlined. Summing up, at a general level, all economic components negatively influence environmental wellbeing. Equally, organic farming, genuine savings, GDP, employment and public debt, as economic wellbeing components, become significant in stage 3, compared to stage 2, where only genuine savings and public debt are significant. Moving on, in terms of human wellbeing, in stage 2, the basic needs and personal development and health are the significant variables, meaning that both of them represent a priority for improving environmental wellbeing. On the contrary, in stage 3, the significant variables are the ones regarding a well-balanced society. Thus, it can be stated that the economic component plays a greater role in determining the level of environmental wellbeing in stage 3, where innovation is the main driver of development while, in stage 2, with efficiency-driven economies, priority has to be given to human wellbeing components, especially to the ones related to basic needs and personal development and health, in the context in which they still exercise negative influences on the environment.

In this way, special attention should be paid the fact that the model of development observed in practice seems to have some results in terms of sustainability goals, but not sufficient for proving that the traditional growth-oriented model has been abandoned, the economic and, also, social components still having a negative influence on environmental wellbeing. Consequently, our paper agrees with the results obtained in other studies that emphasize the impossibility to precisely detect the consequences of different patterns of managing development, while underlining the idea that the economic and social dimension may influence in a negatively, costly and potentially irreversible way the wellbeing of our major commune good, i.e. the environment.

In this context, it is clearly a place of improvement in the process of development intended to be performed in a sustainable manner and, as shown in this paper, specific directions of actions may be the factors that significantly and negatively affect the wellbeing of environment. Moreover, as already demonstrated, these directions may be even particularized in terms of the stage of national development.

Our research results should, however, take into consideration some limits. In this respect, a daunting problem in the study comes from the fact that we were not able to apply the analysis for a more actual and larger period of time because of lack of data availability. Also, we have to mention other problem in terms of data, i.e. the fact that the levels of each component of SSI are available once at two years. Data for each year would probably provide more accurate results and, consequently, conclusions closer to reality. For responding to these limits, in terms of checking

and comparing the obtained results within this study, it is possible to employ similar approach, but using different indices that evaluate the same issues, like the Index for Sustainable Economic Welfare (ISEW), Environmental Performance Index (EPI), or Ecological Footprint (EF). This may represent a part of a potential future research. Moreover, taking into consideration the fact that, in our study, we focused on the CEECs countries, future research may also employ larger analysis in terms of other groups of countries (like European Union member states, for example) or extending it to all the development stages of countries around the world. Also, starting from our results, especially regarding the ones where negative influences were identified, other future research may contain punctual and deeper analysis for each of them with the aim of improving their thorough understanding, with the emphasis on different ways in which these negative effects might be attenuated.

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Conflict of Interest

The authors declare no conflict of interest.

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